

APPENDIX C

Rainfall Frequency Analysis

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RAINFALL ANALYSIS

A primary goal of the UEC Water Supply Plan is to identify areas of expected water supply shortage and the frequency with which those shortages may occur. Rainfall is responsible for nearly all surface water inflows and outflows in the planning area and is the single most important source of recharge to the Surficial Aquifer. Rainfall is also the single most important variable controlling the occurrence of water shortages in the planning area.

RAINFALL DISTRIBUTION

Rainfall is variable from county to county within the UEC Planning Area. To provide more precise input into the county-level ground water models, the rainfall data was broken down for seven selected rainfall stations. The average annual rainfall for the planning area is 51.6 inches. There is a wet period from June through October, and a dry period from November through May (Figure C-1).

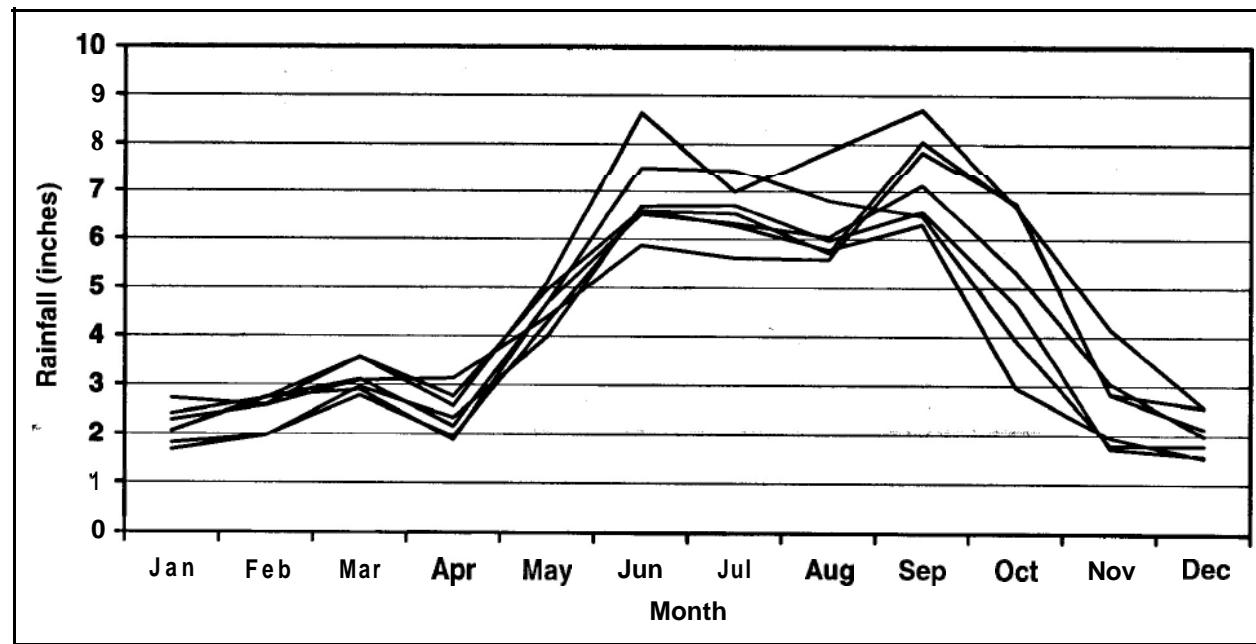


FIGURE C-1. Average Monthly Distribution of Rainfall at Seven Stations in the UEC Planning Area.

The heaviest rainfall usually occurs in September or June, averaging 7.42 inches for the month, and the lightest rain month is usually December, averaging 1.98 inches for the month (Table C-1). The locations of these stations are shown in Figure C-2.

TABLE C-1. Average Rainfall Data for Rainfall Stations in the UEC Planning Area.

County	Rainfall Station	Average Annual Rainfall	Years POR*	Maximum Monthly Rainfall		Minimum Monthly Rainfall		% Rain Falling in Wet Season	Primary DBKEY**
				in	mo	in	mo		
Indian River	Vero	50.60	26 1965-1990	6.51	Jun	1.88	Apr	71.1	06262
Martin	S308	46.76	51 1940-1990	6.70	Jul	1.57	Dec	73.9	06239
	Stuart	55.37	56 1936-1991	8.05	Sep	2.40	Jan	69.6	08187
Palm Beach	Pratt	62.10	36 1957- 1992	8.70	Sep	2.57	Dec, Apr	70.8	06122
Okeechobee	Fort Drum	50.45	36 1956-1 991	7.52	Jun	1.78	Dec	73.1	06141
St. Lucie	Cow Creek	44.14	22 1970-1 991	6.59	Jun	1.54	Dec	72.9	05848
	Fort Pierce	52.02	79 1914-1 992	7.84	Sep	2.13	Dec	69.2	06151
Overall Average		51.63		7.42		1.98		71.5	

Period of Record

**For those interested in accessing DBHYDRO. Missing data were replaced with county-wide average data.

RAINFALL DATA PREPARATION

The District has a network of rainfall stations that provides historical rainfall data. Long-term data were obtained from seven rainfall stations with relatively long and reliable records. This data is maintained in the District's DBHYDRO database. The DBHYDRO dbkey values for these stations are listed in Table C-1. Tables C-2 through C-8 show the monthly rainfall for each rainfall station for the entire period of record. The period of record varies from table to table, as shown in Table C-1.

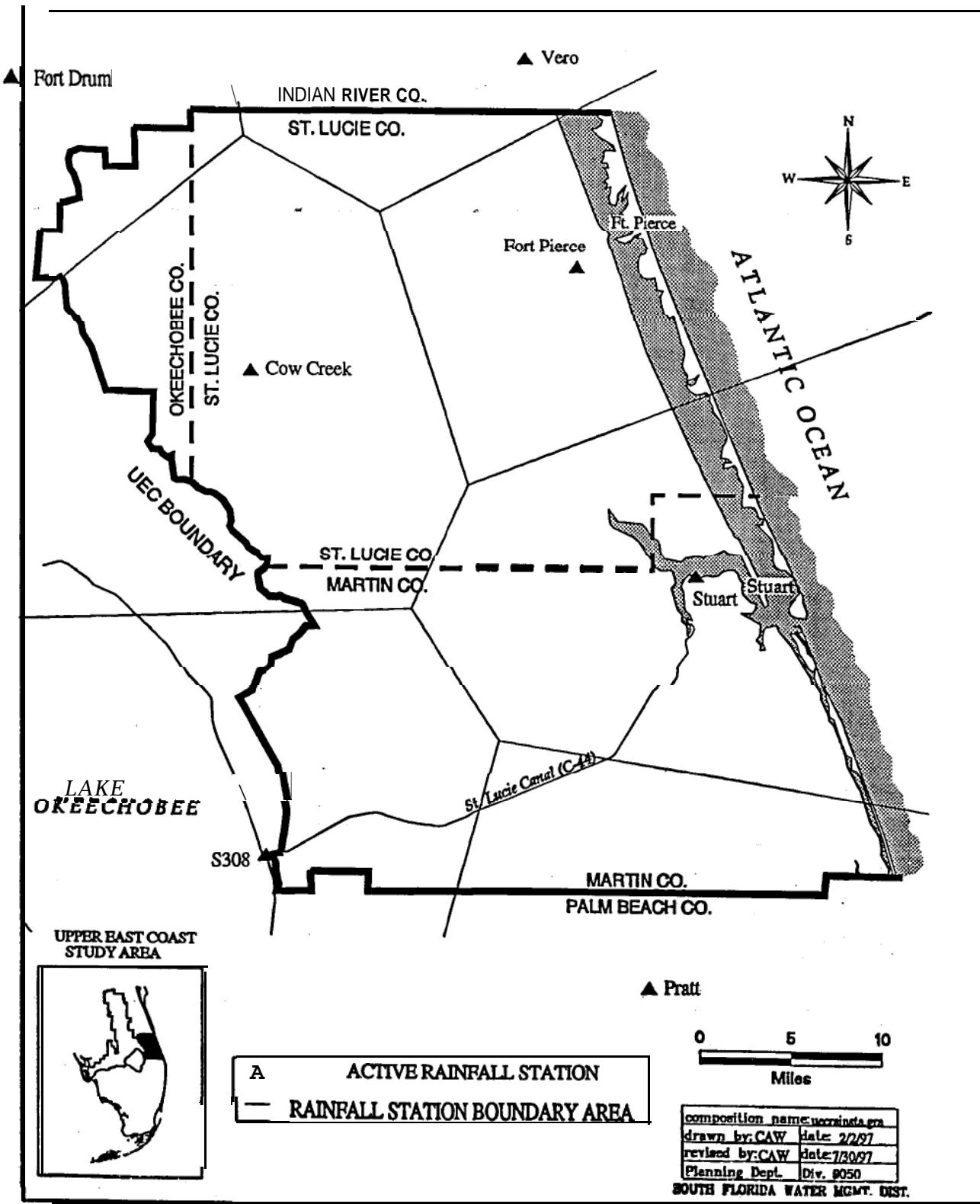


FIGURE C-2. Rainfall stations in the UEC Planning Area.

TABLE C-2. Monthly and Mean Rainfall (inches) at Cow Creek Rainfall Station.

YEAR	Cow Creek Rainfall Station												
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	SUM
1970	4.23	3.09	8.07	0.17	4.79	5.75	4.90	4.21	7.94	6.94	0.76	0.59	51.44
1971	0.37	2.66	1.37	1.70	5.05	8.20	9.12	1.52	5.84	3.15	0.06	0.92	39.96
1972	0.28	0.83	4.07	0.82	5.66	10.00	4.71	9.49	1.87	2.20	2.20	0.75	42.88
1973	2.72	1.70	3.65	1.59	5.05	5.19	7.90	2.34	5.53	3.24	0.15	1.15	40.21
1974	1.51	0.67	0.17	1.87	1.92	10.40	11.40	7.34	3.80	2.83	2.50	1.20	45.61
1975	0.15	3.83	0.00	1.25	7.03	9.25	7.41	8.55	4.55	3.14	0.40	0.97	46.53
1976	0.37	1.22	0.62	1.81	11.80	8.10	5.70	0.90	6.64	0.10	2.66	2.51	42.43
1977	1.60	0.97	0.30	0.87	3.66	6.07	5.27	6.62	6.55	1.93	4.09	3.02	40.95
1978	2.05	1.55	3.50	1.72	3.12	10.50	7.68	2.55	6.34	3.34	1.00	5.49	48.84
1979	5.29	0.04	1.46	1.81	10.10	2.20	3.11	6.65	18.60	0.90	1.77	1.28	53.21
1980	3.08	2.16	2.50	4.48	2.90	3.42	4.21	4.90	1.92	1.16	2.87	0.66	34.26
1981	0.35	2.10	0.64	0.15	3.67	5.25	1.71	9.95	6.82	2.30	0.85	0.23	34.02
1982	1.02	2.79	9.95	6.34	4.47	8.28	6.90	7.17	4.28	2.18	1.85	0.50	55.73
1983	2.66	6.13	2.82	0.65	2.12	6.33	4.24	8.45	5.84	5.53	0.77	3.96	49.50
1984	0.18	3.49	2.68	0.92	2.76	2.35	5.98	4.53	7.79	0.44	4.34	0.73	36.19
1985	0.24	0.10	2.09	4.05	2.92	6.25	10.00	6.77	9.35	2.97	2.10	1.05	47.89
1986	1.67	1.83	2.95	0.22	3.26	9.66	6.48	9.32	4.95	5.94	1.09	3.63	51.00
1987	1.21	1.72	4.10	0.00	2.17	5.80	4.09	2.36	2.88	4.31	7.32	0.00	35.96
1988	2.26	1.66	3.09	2.06	4.72	4.67	8.35	7.83	1.52	1.32	2.86	1.51	41.85
1989	2.11	0.32	2.78	3.77	0.78	5.54	3.06	4.37	5.20	3.73	0.40	2.83	34.89
1990	1.11	2.70	0.53	0.77	3.24	6.11	3.72	6.59	13.80	2.86	1.22	0.39	43.04
1991	5.37	1.74	3.63	5.65	2.98	5.66	12.00	4.62	6.48	4.38	1.67	0.42	54.60
Mean	1.81	1.97	2.77	1.94	4.28	6.59	6.27	5.77	6.30	2.95	1.95	1.54	44.14

TABLE C-3. Monthly and Mean Rainfall (inches) at Fort Drum Rainfall Station.

YEAR	Fort Drum Rainfall Station												
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	SUM
1956	1.10	2.26	0.55	2.92	3.44	7.15	5.92	6.77	6.23	11.28	0.61	0.16	48.39
1957	0.88	2.35	5.47	6.60	4.82	4.08	9.51	8.78	9.84	3.51	1.25	3.36	60.45
1958	6.52	1.98	4.60	2.67	3.37	8.39	5.34	5.85	1.48	2.93	0.47	2.36	45.96
1959	2.68	1.62	7.41	4.90	5.92	9.42	5.37	6.11	5.51	12.06	1.55	1.34	63.89
1960	0.40	5.05	6.20	2.68	2.26	6.28	8.41	3.66	13.85	3.93	0.46	0.78	53.96
1961	2.27	0.95	2.13	2.09	4.12	4.17	3.51	9.72	0.68	4.14	1.44	0.16	35.38
1962	0.53	1.52	2.83	1.55	4.38	13.92	5.55	14.04	7.83	0.34	3.43	0.36	56.28
1963	1.90	5.36	1.28	1.38	5.35	6.65	2.68	2.99	7.57	2.27	4.28	3.72	45.43
1964	1.65	3.99	1.54	3.58	4.15	2.09	5.09	9.42	8.82	2.64	0.32	3.01	46.30
1965	0.38	3.55	4.71	0.64	0.05	4.55	8.13	5.72	5.94	7.77	0.69	1.61	43.74
1966	4.34	4.10	0.85	2.01	7.37	8.24	4.59	6.95	5.71	3.29	0.82	0.39	48.66
1967	0.31	3.88	1.10	0.00	0.47	8.98	12.18	5.13	6.31	1.30	0.77	2.20	42.63
1968	0.93	1.45	0.63	0.25	3.63	14.21	12.68	2.28	2.36	7.46	2.27	0.46	48.61
1969	2.63	1.46	7.11	3.84	4.89	2.42	3.88	10.72	4.00	11.09	2.89	2.08	57.01
1970	4.74	3.52	4.93	0.07	2.21	3.62	4.82	3.51	4.57	2.96	0.11	0.86	35.92

Fort Drum Rainfall Station														
YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	SUM	
1971	0.11	3.38	1.62	0.53	5.28	12.60	10.44	5.14	6.90	4.27	0.41	1.40	52.08	
1972	1.09	4.59	3.17	1.60	6.95	8.66	4.41	9.02	2.09	1.73	3.10	1.68	48.09	
1973	4.97	2.52	2.83	2.24	6.41	10.40	13.83	5.72	7.81	2.89	0.86	1.70	62.18	
1974	1.02	1.83	0.08	2.50	3.63	10.63	10.54	10.90	8.09	2.46	0.78	1.48	53.94	
1975	0.18	1.89	2.22	1.24	10.59	4.71	15.95	4.22	6.39	5.43	1.31	1.00	55.13	
1976	0.35	0.59	1.08	3.03	14.52	7.05	7.39	4.44	10.16	0.65	1.48	3.49	54.23	
1977	1.10	1.23	0.53	0.55	3.14	6.41	6.24	8.62	7.13	0.84	5.00	4.29	45.08	
1978	1.19	2.80	3.34	0.14	6.36	12.09	9.98	5.34	7.96	1.83	2.83	3.34	57.20	
1979	6.80	0.77	0.98	2.91	14.33	1.74	5.69	3.80	20.75	0.77	0.89	1.80	61.23	
1980	2.52	2.92	3.89	3.36	2.76	6.13	4.38	3.18	2.92	0.79	2.66	2.02	37.53	
1981	0.33	3.35	1.85	0.20	1.54	4.29	4.08	8.82	3.54	2.43	1.52	0.79	32.74	
1982	1.12	2.92	6.86	5.47	5.55	8.42	8.80	9.20	5.76	2.44	2.93	1.79	61.26	
1983	4.02	7.60	5.20	1.15	1.48	10.85	7.20	10.68	4.65	4.46	2.38	4.62	64.29	
1984	0.45	4.24	2.41	1.78	5.23	4.53	9.35	9.08	5.63	0.57	3.81	1.52	48.60	
1985	0.53	0.40	2.99	2.49	1.75	5.04	8.10	7.38	13.01	2.97	1.17	1.18	47.01	
1986	3.03	1.36	5.03	0.00	2.72	12.48	7.93	6.74	2.99	8.43	0.98	3.31	55.00	
1987	3.83	0.68	10.76	0.24	3.61	6.82	5.20	2.36	6.30	3.45	6.94	0.31	50.50	
1988	2.65	2.70	4.05	1.46	3.96	8.05	7.33	6.27	2.00	1.79	2.86	1.51	44.63	
1989	2.10	1.05	5.24	3.42	1.07	6.64	4.98	9.30	7.89	8.24	1.10	2.92	53.95	
1990	0.00	4.21	1.10	1.95	4.20	5.76	9.22	6.97	4.77	5.07	0.00	0.00	43.25	
1991	4.99	3.82	5.35	6.15	6.55	13.38	9.90	5.99	5.82	2.62	0.00	1.01	65.58	
Mean	2.05	2.72	3.39	2.16	4.67	7.52	7.46	6.80	6.48	3.92	1.79	1.78	50.73	

TABLE C-4. Monthly and Mean Rainfall (inches) at Fort Pierce Rainfall Station.

Fort Pierce Rainfall Station														
YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	SUM	
1914	2.86	2.95	0.62	4.53	3.29	3.05	7.17	4.28	11.13	5.93	4.18	3.44	53.43	
1915	9.36	2.24	2.74	1.36	2.25	5.41	8.81	7.91	7.44	10.88	3.35	1.89	63.64	
1916	1.83	2.05	0.60	1.84	4.04	5.75	3.53	2.98	8.06	10.34	2.94	1.19	45.15	
1917	0.90	3.23	0.19	0.44	1.18	4.66	5.09	3.18	6.67	3.37	0.49	2.65	32.05	
1918	3.51	0.69	4.38	6.74	1.35	6.30	8.21	2.74	14.22	6.02	0.89	1.31	56.36	
1919	2.16	4.30	5.64	2.15	2.94	4.13	9.43	5.33	2.82	0.60	7.32	2.14	48.96	
1920	7.38	1.97	2.13	4.22	4.50	2.83	5.91	5.32	9.67	4.14	3.50	0.78	52.35	
1921	0.43	1.99	1.56	1.36	6.26	1.96	6.90	1.63	0.75	11.31	0.98	1.02	36.15	
1922	2.18	3.19	0.60	0.65	2.54	2.94	4.34	5.88	8.44	10.46	2.10	0.67	43.99	
1923	1.28	0.30	0.79	4.84	7.72	8.40	5.39	1.09	8.50	2.93	0.46	1.12	42.82	
1924	5.16	1.47	3.63	2.22	4.42	0.69	7.38	1.41	7.19	19.31	0.38	1.28	54.54	
1925	4.99	2.15	3.31	1.75	7.16	5.21	6.44	5.49	1.91	1.79	10.65	6.77	57.62	
1926	7.48	1.84	2.40	4.75	0.72	9.52	12.74	7.74	11.07	1.88	0.71	1.03	61.88	
1927	0.65	0.78	1.56	1.21	0.92	2.00	4.93	5.13	11.81	10.27	1.95	0.56	41.77	
1928	1.04	1.27	3.56	0.25	3.88	3.98	2.84	14.57	4.72	3.50	1.70	0.35	41.66	
1929	1.89	0.59	2.32	1.46	11.09	6.85	5.45	3.04	6.97	8.76	1.60	2.51	52.53	
1930	1.78	5.28	5.43	7.72	7.41	11.88	2.78	3.84	7.34	4.78	2.90	3.49	64.63	
1931	3.27	0.79	3.76	11.16	1.80	1.17	6.39	4.12	6.89	6.37	1.48	1.37	48.57	

YEAR	Fort Pierce Rainfall Station												
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	SUM
1932	1.45	1.44	3.04	1.74	4.16	12.90	1.48	6.41	5.44	4.05	6.86	0.94	49.91
1933	1.98	1.18	4.23	9.86	1.65	5.45	2.98	8.87	6.36	12.97	3.62	0.75	59.90
1934	1.49	5.54	2.12	5.44	5.72	4.97	2.89	4.00	3.68	3.09	1.06	1.32	41.32
1935	0.22	1.61	0.27	5.31	3.44	9.15	4.00	3.57	6.53	10.63	0.77	0.99	46.49
1936	1.83	4.94	3.44	2.74	5.87	12.00	3.81	2.60	10.33	6.41	4.54	4.42	62.93
1937	1.60	4.55	9.08	5.09	9.90	2.80	3.32	4.75	7.75	12.46	6.94	0.93	69.17
1938	0.46	1.11	0.49	0.39	3.25	5.72	3.95	2.65	8.42	6.46	4.07	1.25	38.22
1939	0.48	0.46	1.11	5.16	4.61	4.59	6.21	3.30	5.12	10.42	1.55	1.12	44.13
1940	2.98	2.53	4.92	0.96	3.76	6.34	5.16	5.55	12.40	1.95	0.23	3.51	50.29
1941	5.92	5.64	3.03	7.51	3.02	5.73	8.23	3.74	14.19	5.80	6.30	4.32	73.43
1942	2.16	4.24	6.17	1.17	7.94	7.65	1.94	2.43	5.95	1.84	0.87	5.10	47.46
1943	0.29	1.28	5.57	1.11	4.96	5.10	6.65	9.29	6.30	5.84	2.65	0.59	49.63
1944	1.10	0.27	1.73	6.74	2.15	7.46	5.82	4.49	4.90	11.56	1.55	0.57	48.34
1945	1.16	0.37	1.51	1.69	0.98	4.23	4.32	5.38	17.05	6.74	4.28	4.17	51.88
1946	1.20	0.77	2.32	0.42	6.75	3.71	5.23	5.53	6.23	4.75	3.13	3.55	43.59
1947	1.42	3.48	6.75	4.62	5.23	5.58	8.79	6.97	15.22	12.35	6.03	1.32	77.76
1948	5.11	0.58	2.27	5.10	4.27	3.74	5.56	9.70	14.31	4.78	1.43	1.11	57.96
1949	1.01	1.88	0.81	2.97	3.53	6.90	4.67	12.16	8.97	5.80	0.37	5.57	54.64
1950	0.68	1.58	4.04	3.28	3.83	3.68	4.21	12.12	8.59	11.01	2.48	0.72	56.22
1951	0.31	2.21	0.76	10.25	3.84	4.02	3.11	5.21	7.03	10.73	3.28	0.84	51.59
1952	2.45	7.08	2.31	2.11	1.04	1.03	6.96	7.58	5.48	13.50	0.55	1.32	51.41
1953	1.98	1.40	9.83	3.36	1.41	5.81	4.27	6.58	7.16	10.14	4.40	1.32	57.66
1954	2.32	1.92	2.13	10.82	4.91	12.48	5.92	5.81	9.50	7.46	6.08	0.60	69.95
1955	1.64	1.32	2.41	3.26	4.24	7.43	3.35	7.35	4.83	7.67	0.09	4.98	48.57
1956	0.41	2.76	0.53	2.76	2.03	1.58	5.73	4.03	7.82	10.51	0.55	0.90	39.61
1957	0.99	3.87	5.03	5.31	5.22	5.72	10.67	6.77	6.93	7.69	1.96	2.56	62.72
1958	8.39	0.88	3.49	2.00	6.88	5.70	1.79	5.70	3.15	8.94	0.81	4.07	51.80
1959	2.52	0.96	7.76	1.41	4.54	13.51	4.97	5.86	10.55	11.41	3.78	2.92	70.19
1960	0.19	6.13	3.93	5.85	4.30	6.52	6.05	7.78	16.73	4.85	0.84	1.10	64.27
1961	3.24	1.39	3.40	1.14	7.18	5.47	1.25	5.19	3.24	5.09	1.22	0.49	38.30
1962	0.64	0.71	2.82	3.19	2.20	5.11	12.65	8.46	5.19	3.63	1.68	0.28	46.56
1963	0.80	4.82	1.67	0.35	2.71	5.43	5.10	2.66	19.90	7.49	3.05	8.21	62.19
1964	2.16	6.13	1.36	5.44	3.24	2.44	7.16	9.80	6.19	9.96	0.47	1.64	55.99
1965	0.45	5.61	3.40	2.07	0.66	5.52	5.90	1.37	3.28	7.10	1.42	1.52	38.30
1966	3.73	7.60	2.29	3.01	6.57	11.26	4.96	2.72	6.76	4.52	2.28	1.31	57.01
1967	1.29	2.69	1.66	0.34	0.37	8.57	5.20	5.03	5.32	6.92	0.27	1.81	39.47
1968	0.48	1.81	0.87	0.87	3.80	15.84	6.61	6.91	7.87	7.06	1.97	0.13	54.22
1969	2.29	1.05	7.78	1.18	8.27	3.45	4.99	8.94	9.81	11.41	5.67	3.10	67.94
1970	3.92	2.60	7.26	0.45	7.81	3.20	3.81	4.92	12.32	9.67	1.41	1.13	58.50
1971	0.46	3.57	1.55	1.67	2.18	6.82	9.43	3.78	4.87	6.19	1.78	4.29	46.59
1972	2.37	4.55	2.69	4.31	5.21	10.11	5.33	4.60	2.04	5.37	4.03	1.77	52.38
1973	3.37	2.61	2.18	2.06	5.49	7.95	5.16	6.55	9.11	6.47	1.49	1.38	53.82
1974	2.66	0.86	0.48	2.07	4.93	8.08	12.62	4.48	6.21	3.62	2.10	1.82	49.93
1975	0.19	2.21	1.91	1.44	7.82	5.16	5.70	3.19	8.43	2.62	3.38	1.35	43.40
1976	0.40	1.51	0.72	4.51	7.74	7.70	2.68	4.44	5.45	0.66	2.87	3.47	42.15

Fort Pierce Rainfall Station													
YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	SUM
1977	2.03	1.76	0.70	1.03	5.54	3.63	2.69	4.89	10.22	4.47	2.48	5.12	44.56
1978	3.21	2.93	2.95	1.96	5.48	5.67	9.37	5.33	4.94	8.00	2.28	7.25	59.37
1979	5.39	0.93	1.13	1.90	5.56	5.22	7.92	3.97	14.22	1.44	2.10	1.66	51.44
1980	3.12	2.79	2.15	2.90	2.54	4.65	6.59	1.31	6.30	6.94	4.78	1.97	46.04
1981	0.57	2.16	1.04	0.35	4.84	0.78	5.72	12.25	5.84	4.05	2.21	0.38	40.19
1982	1.39	3.63	7.48	4.10	12.97	8.31	5.64	5.24	4.86	2.76	8.70	1.79	66.87
1983	4.35	8.21	5.51	2.89	1.15	6.35	1.53	10.74	8.18	10.82	0.91	3.94	64.58
1984	0.94	2.77	4.05	0.76	7.85	4.15	3.80	7.41	6.93	1.34	9.33	0.86	50.19
1985	0.68	0.24	3.31	3.68	4.30	5.05	6.45	6.21	17.50	4.29	2.77	1.50	55.98
1986	3.40	1.80	8.94	0.17	2.43	7.45	6.06	9.21	7.29	6.11	3.21	4.05	60.12
1987	1.57	1.51	4.93	0.32	3.45	2.87	3.49	3.89	4.98	11.36	6.16	0.27	44.80
1988	2.85	2.91	3.43	1.49	2.73	1.54	5.90	4.35	1.34	2.45	2.19	1.48	32.66
1989	3.34	0.22	3.08	2.56	2.88	3.00	1.21	5.83	3.58	6.52	0.93	3.36	36.51
1990	1.65	2.33	0.72	0.65	4.33	3.14	8.13	4.54	11.27	3.71	2.40	0.44	43.31
1991	4.36	6.46	4.42	6.70	6.46	6.49	13.17	3.41	5.91	4.58	1.20	1.72	64.88
1992	0.94	3.33	1.12	4.34	1.00	14.13	1.33	7.48	7.50	1.38	7.74	2.00	52.29
Mean	2.28	2.57	3.08	3.13	4.39	5.86	5.61	5.58	7.84	6.74	2.82	2.13	52.02

TABLE C-5. Monthly and Mean Rainfall (inches) at Pratt Rainfall Station.

Pratt Rainfall Station													
YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	SUM
1957	2.57	2.57	3.40	7.42	6.51	5.59	9.39	4.97	7.75	6.74	0.69	6.41	64.01
1958	13.52	0.44	5.25	2.97	9.01	1.54	3.55	3.84	7.92	4.54	1.98	5.66	60.22
1959	3.10	0.51	7.56	4.49	5.63	4.86	4.02	9.34	9.58	8.35	9.62	4.48	71.54
1960	1.00	4.89	1.40	7.56	4.74	7.77	2.67	9.15	8.55	5.36	0.40	0.32	53.81
1961	2.90	0.95	2.50	1.30	7.60	2.17	5.25	8.50	3.47	6.61	1.18	0.02	42.45
1962	0.33	0.00	2.76	3.40	3.95	8.81	8.24	8.53	6.17	5.05	0.40	0.35	47.99
1963	0.55	2.82	1.10	1.00	5.75	4.70	4.60	9.20	8.37	8.15	2.22	8.85	57.31
1964	1.15	3.30	0.11	1.80	3.86	11.65	7.86	12.51	8.45	13.85	2.86	1.58	68.98
1965	0.90	3.32	2.45	0.20	1.40	4.59	6.25	7.00	5.80	10.90	0.20	0.00	43.01
1966	9.78	3.60	1.80	1.99	4.90	12.95	5.00	7.51	6.56	8.85	1.66	1.65	66.25
1967	1.55	3.25	3.10	0.00	0.60	9.35	10.55	6.65	7.45	9.00	1.20	1.05	53.75
1968	0.35	2.35	0.90	0.40	8.00	21.90	9.50	10.40	10.80	7.75	2.15	0.00	74.50
1969	2.05	1.35	7.05	2.35	6.75	5.70	2.65	9.42	6.25	10.95	1.95	1.25	57.72
1970	2.85	2.45	13.50	1.60	7.00	7.65	10.25	5.55	6.00	2.65	0.00	0.30	59.80
1971	0.80	3.10	1.00	0.35	2.85	6.65	8.80	8.55	7.15	8.05	6.50	4.90	58.70
1972	1.55	2.20	3.65	5.65	8.25	10.62	5.70	5.90	3.20	6.00	3.45	1.10	57.27
1973	3.00	1.20	1.30	1.55	3.25	10.20	7.70	6.95	5.20	8.80	0.65	3.91	53.71
1974	8.69	0.35	3.00	0.40	3.00	16.70	9.54	9.60	5.90	3.65	5.35	0.85	67.03
1975	0.70	4.70	1.25	1.75	6.85	11.55	7.30	2.50	9.05	5.95	1.50	0.61	53.71
1976	0.25	3.90	0.07	2.40	11.60	6.40	4.80	8.40	13.80	0.50	2.20	2.44	56.76
1977	3.55	0.75	0.35	0.00	5.45	4.70	5.05	6.85	15.05	0.58	5.15	5.00	52.48
1978	1.50	1.15	3.70	0.85	6.05	24.35	12.40	7.40	8.60	9.20	7.75	5.70	88.65

YEAR	Pratt Rainfall Station												
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	SUM
1979	4.20	0.30	2.30	2.20	4.74	7.00	3.32	2.54	14.88	9.86	4.55	1.35	57.24
1980	1.60	1.90	1.85	2.80	6.47	5.00	8.55	3.61	6.48	6.00	2.54	1.52	48.32
1981	0.60	2.00	0.80	0.20	3.64	6.20	5.85	14.15	12.37	3.25	3.20	1.75	54.01
1982	1.50	3.60	14.65	2.60	10.16	7.82	13.00	6.30	9.95	6.10	16.25	2.10	94.03
1983	5.20	10.97	4.95	4.45	3.00	9.05	5.45	7.26	16.90	15.30	3.40	12.45	98.38
1984	0.40	2.53	4.58	1.55	6.73	3.56	2.95	4.45	14.20	2.84	14.60	0.00	58.39
1985	0.78	0.00	3.00	5.74	1.18	8.45	8.30	4.95	12.70	4.95	1.16	3.15	54.36
1986	4.64	1.70	7.85	0.15	1.45	16.64	10.02	5.80	6.94	6.14	4.45	4.80	70.58
1987	0.72	1.32	4.10	0.75	2.65	3.85	6.02	2.20	8.90	8.25	12.10	0.60	51.46
1988	3.20	3.19	3.60	1.40	6.52	4.48	9.94	11.25	0.90	0.84	1.50	0.50	47.32
1989	0.70	0.60	4.01	4.50	0.60	7.90	9.43	9.09	5.75	8.56	3.35	2.75	57.24
1990	1.63	4.35	4.65	4.30	4.97	1.55	8.79	14.37	10.10	3.62	2.64	2.23	63.20
1991	9.28	6.25	2.67	9.50	7.32	7.08	6.26	5.34	4.87	10.42	4.54	1.55	75.08
1992	0.45	4.98	1.90	2.99	1.35	21.89	2.57	22.81	17.29	2.35	16.49	1.30	96.37
Mean	2.71	2.58	3.56	2.57	5.10	8.64	6.99	7.86	8.70	6.67	4.16	2.57	62.10

TABLE C-6. Monthly and Mean Rainfall (inches) at S308 Rainfall Station.

YEAR	S308 Rainfall Station												
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	SUM
1940	2.68	2.82	5.95	2.92	2.93	7.44	4.92	8.02	6.71	0.96	0.18	3.13	48.66
1941	4.00	4.41	3.73	9.07	1.89	3.09	10.81	4.42	8.30	5.09	2.53	2.97	60.31
1942	1.40	3.17	5.11	1.79	7.66	7.66	5.25	5.88	1.76	0.40	0.79	1.67	42.54
1943	0.06	0.40	2.12	3.10	1.32	6.91	8.30	5.15	6.78	1.39	2.07	0.19	37.79
1944	1.19	0.08	1.61	3.38	5.27	1.44	6.16	3.46	5.72	7.37	0.27	0.16	36.11
1945	1.05	0.23	0.00	0.69	1.75	5.60	6.58	0.01	11.52	6.59	1.47	1.34	36.83
1946	0.82	1.86	3.27	0.00	5.37	6.09	6.38	2.98	4.98	1.71	4.70	1.63	39.79
1947	0.15	2.16	9.00	2.53	5.82	5.90	8.02	5.74	14.29	10.35	1.44	0.90	66.30
1948	2.99	0.00	1.92	3.97	1.09	2.10	9.51	7.71	10.57	1.75	0.32	0.01	41.94
1949	0.00	0.00	0.04	1.61	1.64	10.09	4.64	10.89	6.76	3.04	0.84	2.79	42.34
1950	0.02	1.64	4.70	0.33	4.65	1.41	7.54	4.90	2.84	9.57	1.47	0.65	39.72
1951	0.00	1.75	0.68	4.72	1.59	10.58	6.78	7.13	3.90	8.78	1.79	0.05	47.75
1952	0.97	4.19	1.24	1.50	3.50	2.71	6.22	5.47	10.36	9.49	0.20	0.46	46.31
1953	1.38	1.59	1.43	3.26	1.25	13.58	9.93	10.22	7.51	6.69	0.98	1.02	58.84
1954	0.00	2.56	2.42	6.88	4.16	10.22	4.95	2.75	7.34	3.29	1.09	1.41	47.07
1955	1.64	0.58	1.48	3.08	1.58	10.02	7.77	7.67	5.86	1.95	0.12	3.02	44.77
1956	0.63	1.16	0.70	3.88	1.93	3.12	1.97	3.57	5.17	8.74	0.19	0.07	31.13
1957	2.42	2.47	3.52	5.55	4.46	2.12	4.87	4.39	7.71	2.43	0.74	5.69	46.37
1958	7.06	0.51	5.85	3.32	6.64	3.33	3.50	4.35	5.52	2.39	0.06	3.45	45.98
1959	1.18	0.32	4.36	1.64	8.88	9.16	6.45	3.42	7.19	6.33	2.42	1.39	52.74
1960	0.00	5.79	0.70	3.97	2.90	4.97	3.01	3.56	11.22	3.20	1.04	0.52	40.88
1961	1.73	0.31	1.98	1.41	4.45	1.95	3.61	5.91	1.15	4.66	1.19	0.03	28.38
1962	0.26	0.92	3.86	4.17	0.45	4.38	7.22	4.07	7.53	3.25	1.87	0.16	38.14
1963	0.86	3.85	0.64	1.37	3.99	7.40	5.34	5.43	3.12	1.31	2.15	5.62	41.08
1964	1.48	2.41	0.74	4.29	3.88	8.16	11.70	9.61	3.54	4.58	0.12	0.98	51.49

YEAR	S308 Rainfall Station												
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	SUM
1965	0.21	3.99	1.95	0.19	1.40	10.68	7.73	8.77	3.96	10.26	0.12	1.00	50.26
1966	4.00	3.73	0.80	4.50	4.47	12.05	5.45	5.23	3.50	9.37	0.34	0.40	53.84
1967	0.88	3.19	1.06	0.05	3.44	11.79	6.30	8.03	8.41	6.09	0.16	1.53	50.93
1968	0.25	2.23	0.88	0.20	8.23	14.75	5.67	3.84	5.79	8.26	2.15	0.02	52.27
1969	1.51	2.02	6.53	1.54	5.43	8.08	4.69	5.87	8.67	11.15	1.78	3.38	60.65
1970	3.11	3.64	14.65	0.03	9.24	7.19	6.97	9.04	2.45	2.90	0.09	0.19	59.50
1971	0.19	2.22	0.90	0.17	6.12	6.41	9.11	5.69	4.25	9.25	2.41	2.13	48.85
1972	1.76	1.26	2.38	4.23	3.60	10.98	10.91	5.78	2.95	1.48	1.84	2.46	49.63
1973	1.69	1.83	3.15	0.87	3.86	8.70	11.54	6.14	2.34	4.93	0.10	1.43	46.58
1974	1.29	0.22	0.19	2.20	1.75	11.28	3.67	7.60	9.19	2.17	1.66	0.97	42.19
1975	0.92	2.23	1.93	0.27	4.84	6.72	13.48	3.56	6.33	3.77	0.57	0.34	44.96
1976	0.16	1.79	0.09	1.07	9.10	6.47	3.38	9.86	3.57	1.74	2.87	1.06	41.16
1977	4.53	0.66	1.24	0.73	2.71	2.06	7.33	8.38	11.67	2.84	5.33	4.56	52.04
1978	2.94	1.66	3.07	1.46	3.89	11.64	8.02	6.33	9.34	3.45	3.16	4.32	59.28
1979	6.75	0.14	2.36	1.51	5.55	3.54	3.27	3.64	14.90	2.88	2.12	1.44	48.10
1980	2.98	1.84	1.67	2.77	4.99	4.06	7.05	4.98	6.48	3.06	2.54	1.25	43.67
1981	0.94	1.16	1.00	0.10	2.04	0.98	4.05	9.72	4.23	0.90	0.92	0.17	26.21
1982	0.46	2.35	12.17	3.95	7.63	8.74	7.50	5.86	6.50	1.15	1.90	1.42	59.63
1983	4.47	8.82	4.49	3.41	2.35	7.29	4.84	3.80	8.69	10.15	1.73	2.68	62.72
1984	0.81	3.23	4.19	0.56	7.41	6.11	7.77	3.31	9.19	1.98	7.73	0.26	52.55
1985	0.54	0.12	2.20	2.82	1.99	5.27	7.70	4.58	10.16	3.12	0.00	1.66	40.16
1986	3.64	0.68	5.10	0.09	1.91	9.80	7.32	5.80	7.34	5.11	2.55	3.72	53.06
1987	1.64	1.10	4.81	0.87	3.95	4.53	6.10	2.09	2.82	6.70	7.48	0.03	42.12
1988	2.61	2.83	2.32	0.14	3.69	4.83	9.55	13.58	1.53	0.38	5.38	0.83	47.67
1989	1.15	0.33	3.71	4.31	1.60	3.53	3.48	7.80	5.02	4.29	1.28	2.53	39.03
1990	1.97	1.67	0.75	2.13	3.43	3.59	7.14	8.56	8.40	4.65	1.50	0.75	44.54
Mean	1.67	1.96	2.95	2.33	3.99	6.68	6.70	5.97	6.57	4.65	1.72	1.57	46.76

TABLE C-7. Monthly and Mean Rainfall (inches) at Stuart Rainfall Station.

YEAR	Stuart Rainfall Station												
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	SUM
1936	1.87	4.48	4.15	2.12	5.60	7.26	5.48	4.23	6.39	8.70	4.78	4.56	59.62
1937	1.65	1.88	5.65	8.27	2.94	4.88	3.97	2.99	9.42	18.81	5.92	1.06	67.44
1938	1.00	1.32	0.38	0.08	1.94	7.64	5.64	0.61	6.66	11.14	3.03	2.06	41.50
1939	0.34	0.17	1.33	5.16	8.99	4.50	4.94	12.06	7.19	11.04	0.89	1.67	58.28
1940	2.20	3.48	6.85	1.20	2.50	5.59	3.40	7.56	16.40	3.31	0.15	6.34	58.98
1941	6.27	5.47	2.50	6.38	4.87	9.72	8.56	1.66	9.51	4.71	3.44	1.70	64.79
1942	2.42	3.32	5.50	1.83	6.93	12.82	2.04	4.67	9.42	5.56	0.78	3.25	58.54
1943	0.49	0.67	4.34	1.91	7.05	5.56	8.93	3.66	7.91	2.40	3.25	0.80	46.97
1944	2.31	0.25	0.53	2.18	2.69	4.18	9.80	4.07	8.17	10.11	0.51	0.88	45.68
1945	1.05	2.00	0.02	0.71	1.27	6.05	8.34	0.01	12.84	7.33	2.77	2.12	44.51
1946	2.64	1.45	1.73	0.00	9.19	6.51	8.51	5.42	4.18	2.17	5.86	1.84	49.50
1947	1.29	2.44	3.02	6.62	3.13	9.03	9.11	4.73	17.24	11.85	3.44	1.27	73.17
1948	3.50	0.83	1.87	4.86	3.38	3.29	5.09	4.33	14.86	4.12	1.16	1.30	48.59

YEAR	Stuart Rainfall Station												
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	SUM
1949	0.27	0.87	0.42	0.45	4.07	9.40	4.56	9.53	7.09	5.84	1.05	8.67	52.22
1950	0.49	0.97	3.70	1.14	3.08	3.36	4.52	6.74	7.21	8.33	1.19	0.58	41.31
1951	0.55	2.11	0.28	3.65	5.04	3.73	5.20	8.27	4.97	10.57	2.36	1.23	47.96
1952	1.29	6.62	4.04	1.51	2.30	2.86	7.80	6.39	5.10	17.36	0.58	0.62	56.47
1953	1.97	2.80	4.31	3.92	1.94	8.66	10.77	6.63	14.51	7.83	2.14	5.00	70.48
1954	0.33	3.31	4.37	4.01	6.77	10.38	7.80	8.88	12.27	6.75	4.20	1.01	70.08
1955	2.49	1.93	2.29	5.25	3.51	9.61	3.08	4.06	2.18	5.09	0.17	3.86	43.52
1956	2.17	2.60	1.15	2.75	5.17	2.60	6.55	4.43	5.12	5.66	0.63	1.85	40.68
1957	1.77	4.02	3.43	5.77	5.78	4.76	8.42	7.97	6.14	8.70	1.53	3.67	61.96
1958	10.66	0.69	5.58	2.62	8.35	3.04	4.34	3.30	5.04	9.19	2.30	5.52	60.63
1959	5.14	0.55	8.65	6.30	4.35	11.46	6.86	9.42	13.24	11.86	6.64	3.31	87.78
1960	0.23	4.58	1.74	5.47	1.73	7.71	11.53	4.60	18.45	2.12	1.68	1.06	60.90
1961	4.46	0.76	4.98	1.63	11.02	4.33	1.13	6.32	2.39	4.80	1.80	0.14	43.76
1962	1.39	0.77	3.53	2.56	1.44	8.18	13.12	11.91	6.18	0.89	1.42	0.20	51.59
1963	0.90	4.59	1.54	0.82	2.73	6.10	2.17	2.51	10.05	10.36	2.80	10.06	54.63
1964	2.25	3.95	1.37	2.84	3.85	4.40	6.58	15.11	5.18	11.81	2.38	2.51	62.23
1965	0.61	4.28	2.27	1.10	0.65	7.13	7.69	2.62	5.36	6.47	1.62	0.77	40.57
1966	6.36	3.86	3.37	4.12	3.69	15.48	3.70	5.66	8.11	6.91	1.20	1.27	63.73
1967	1.09	1.86	2.56	0.11	0.33	9.90	7.66	7.99	4.95	9.25	2.84	1.11	49.65
1968	0.52	2.15	0.93	1.78	8.38	13.72	8.29	6.15	6.57	6.39	2.65	0.12	57.65
1969	2.02	1.28	5.52	1.17	7.12	3.31	3.45	8.54	6.79	6.82	2.41	3.45	51.88
1970	4.94	4.56	18.12	0.00	5.31	7.59	2.40	1.50	8.12	9.37	0.40	0.28	62.59
1971	0.46	2.33	1.68	1.98	6.75	4.14	7.01	2.87	8.44	5.43	4.21	4.72	50.02
1972	1.67	1.85	3.68	6.45	7.37	11.12	11.14	3.30	3.60	2.49	4.61	2.63	59.91
1973	4.51	6.03	2.07	0.89	4.30	7.92	5.56	6.94	6.82	6.87	0.91	1.48	54.30
1974	1.87	0.80	1.40	1.36	3.47	8.25	12.44	5.06	3.59	4.40	3.22	2.04	47.90
1975	0.16	1.53	1.59	1.46	8.82	7.48	4.55	1.97	6.04	3.04	0.90	1.30	38.84
1976	0.46	2.44	0.03	2.57	9.17	6.68	3.15	4.92	6.53	2.82	4.08	5.94	48.79
1977	3.52	0.68	0.59	0.21	3.37	3.56	5.49	3.96	12.40	6.99	3.65	4.46	48.88
1978	3.10	2.19	2.28	2.61	4.99	3.92	6.14	3.42	3.22	4.25	3.08	7.23	46.43
1979	7.03	0.66	1.05	4.08	6.38	3.84	3.07	5.36	14.74	2.70	5.42	1.95	56.28
1980	3.42	3.30	1.41	1.42	5.01	5.17	7.05	3.26	4.71	2.47	4.20	0.30	41.72
1981	0.67	1.82	0.65	0.71	4.21	1.89	2.72	8.72	10.86	3.39	1.93	0.45	38.02
1982	0.81	7.28	13.01	3.56	13.50	9.07	8.74	5.17	6.63	2.41	12.71	2.35	85.24
1983	3.83	13.47	5.72	2.85	2.32	6.79	6.89	7.91	6.73	12.69	2.20	5.49	76.89
1984	0.88	5.77	4.79	1.07	11.13	4.80	3.98	4.39	9.19	1.65	11.01	0.42	59.08
1985	1.54	0.16	5.01	5.94	0.67	5.95	12.23	6.36	12.55	4.18	2.45	3.98	61.02
1986	4.90	1.99	9.17	1.28	4.58	5.86	6.71	7.39	2.97	7.39	2.03	6.41	60.68
1987	2.95	1.67	6.42	0.83	3.33	4.95	5.78	1.88	6.95	7.87	4.65	0.40	47.68
1988	2.70	3.39	4.41	2.78	5.08	4.12	6.98	10.72	1.55	4.84	3.45	1.35	51.37
1989	1.74	0.32	4.07	3.83	4.37	2.85	7.40	6.03	6.32	7.01	0.81	3.11	47.86
1990	2.45	2.21	2.66	0.66	3.77	4.98	10.22	8.35	15.01	3.58	1.99	0.66	56.54
1991	6.83	5.83	6.37	7.92	7.68	10.22	7.17	7.34	6.87	4.56	0.87	1.76	73.42
Mean	2.40	2.72	3.57	2.76	4.95	6.58	6.53	5.71	8.05	6.69	2.83	2.56	55.37

TABLE C-8. Monthly and Mean Rainfall (inches) at Vero Rainfall Station.

YEAR	Vero Rainfall Station												
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	SUM
1965	0.50	5.22	2.80	1.42	0.46	6.33	8.14	4.96	5.44	7.68	2.46	1.39	46.80
1966	3.97	6.22	2.05	3.06	4.11	11.95	7.76	2.10	6.26	12.41	1.97	1.14	63.00
1967	1.55	2.93	1.29	0.63	0.30	5.06	8.42	5.37	3.45	7.28	0.41	1.64	38.33
1968	1.00	1.98	0.23	2.80	6.80	17.18	9.92	6.11	7.16	6.63	2.31	0.12	62.24
1969	2.27	1.13	8.37	1.97	5.04	1.49	7.04	7.82	9.96	9.90	2.83	1.59	59.41
1970	4.47	2.89	5.68	0.26	2.73	4.33	4.14	3.41	10.12	5.13	0.05	0.66	43.87
1971	0.03	2.94	1.40	0.90	3.50	8.10	12.20	2.50	7.70	6.80	2.00	2.20	50.27
1972	1.10	3.90	0.60	4.70	7.50	11.10	2.20	6.70	2.30	2.50	3.30	2.00	47.90
1973	5.30	1.90	2.20	2.70	9.30	12.20	9.50	8.60	8.30	5.12	0.86	1.60	67.58
1974	2.60	2.00	1.90	2.90	4.30	8.80	6.80	8.30	4.00	3.10	2.90	1.50	49.10
1975	0.10	3.70	1.90	0.60	7.70	6.19	3.10	4.90	5.70	4.60	1.20	0.90	40.59
1976	0.50	0.50	0.40	2.10	10.63	8.30	2.10	5.60	9.60	1.40	2.10	3.70	46.93
1977	1.80	1.10	0.30	1.00	4.40	8.90	2.50	5.60	7.40	2.10	3.00	6.60	44.70
1978	1.50	2.40	3.00	0.50	4.10	4.24	5.40	5.05	3.50	3.20	4.40	4.80	42.09
1979	4.71	1.22	1.06	1.89	12.06	3.77	6.20	5.44	17.42	1.65	3.92	1.47	60.81
1980	3.50	3.10	2.90	2.50	3.05	4.41	6.12	3.97	4.78	2.17	3.47	1.53	41.50
1981	0.20	2.60	1.40	0.20	2.30	3.20	2.50	18.00	6.40	2.60	3.00	0.41	42.81
1982	0.97	3.67	8.84	4.00	7.00	8.20	9.10	7.60	7.20	2.60	10.30	2.40	71.88
1983	3.90	9.80	4.50	2.70	1.00	5.60	3.70	9.50	6.31	15.70	1.20	3.80	67.71
1984	1.80	3.70	1.80	1.34	6.40	2.10	3.80	6.90	11.70	3.10	12.60	1.90	57.14
1985	0.67	0.28	2.20	5.20	1.60	3.30	7.70	6.10	12.20	4.20	1.70	1.68	46.83
1986	3.03	1.36	5.03	0.10	1.70	8.10	6.80	3.40	5.90	7.54	2.70	2.50	48.16
1987	2.80	1.20	5.00	0.60	5.10	3.00	5.30	4.20	4.40	6.90	7.70	0.50	46.70
1988	2.30	1.70	5.20	0.50	5.40	3.50	12.40	3.40	1.10	1.60	0.30	2.40	39.80
1989	2.06	1.20	4.50	3.20	1.60	3.70	4.40	4.10	8.30	7.00	0.78	2.92	43.76
1990	0.94	2.70	0.50	1.21	3.56	6.10	7.20	7.54	8.57	5.32	1.58	0.40	45.62
Mean	2.06	2.74	2.89	1.88	4.68	6.51	6.32	6.04	7.12	5.32	3.04	1.99	50.60

FREQUENCY ANALYSIS

1-in-10 Year Drought Event

Model simulations were used to analyze potential impacts on wetlands and aquifer levels within the UEC under average and drought rainfall conditions. The UEC Water Supply Plan Advisory Committee and staff agreed that a 1-in-10 year drought condition is an appropriate event for the plan to balance the needs of all users, including the environment. This is defined as rainfall with a probability of exceedance of 90 percent for a twelve-month period. This means that there is a 10 percent chance that less than this amount will be received in any given year. In other words, an area receives the 10 percent chance rainfall or less, on average, once every 10 years. Other drought events were considered, such as 1-in-5 and 1-in-20 year drought events, but were not used because it was concluded these were not appropriate events to plan for. The 1-in-10 drought condition was codified by Chapter 373, F.S. during the 1997 legislative session.

Statistical vs. Empirical Rainfall Data

Two approaches or methods, statistical and empirical, were used to select the 1-in-10 year drought events for the seven rainfall stations. In the empirical method, a 12-month period was selected from each station's historical period of record with the period total being approximately equal to that of the respective 10 percent chance amount. This method led to inconsistencies among the stations: sets were chosen without regard to the magnitude and frequency of individual monthly values within each set, as long as the total amount matched the 10 percent drought frequency criterion.

More consistent and meaningful rainfall sets were developed based on further statistical analysis of the monthly data. Unlike their predecessors, the monthly values in these sets have a known cumulative frequency and are not drawn from the historical record. The sets have the statistical property that the initial-month and subsequent *cumulative* amounts (including the 12-month total) have a drought frequency of 10 percent. The advantages of this method are that it:

- eliminates subjectivity,
- minimizes influences of peaks and valleys,
- eliminates inequities between rainfall stations, and
- shows a minimal change in annual allocations.

Figure C-3 illustrates the peaks and valleys in the empirical 1-in-10 year drought event for the Fort Pierce rainfall station. Table C-9 shows the variation in supplemental water requirements for citrus at the seven rainfall stations using the two methods.

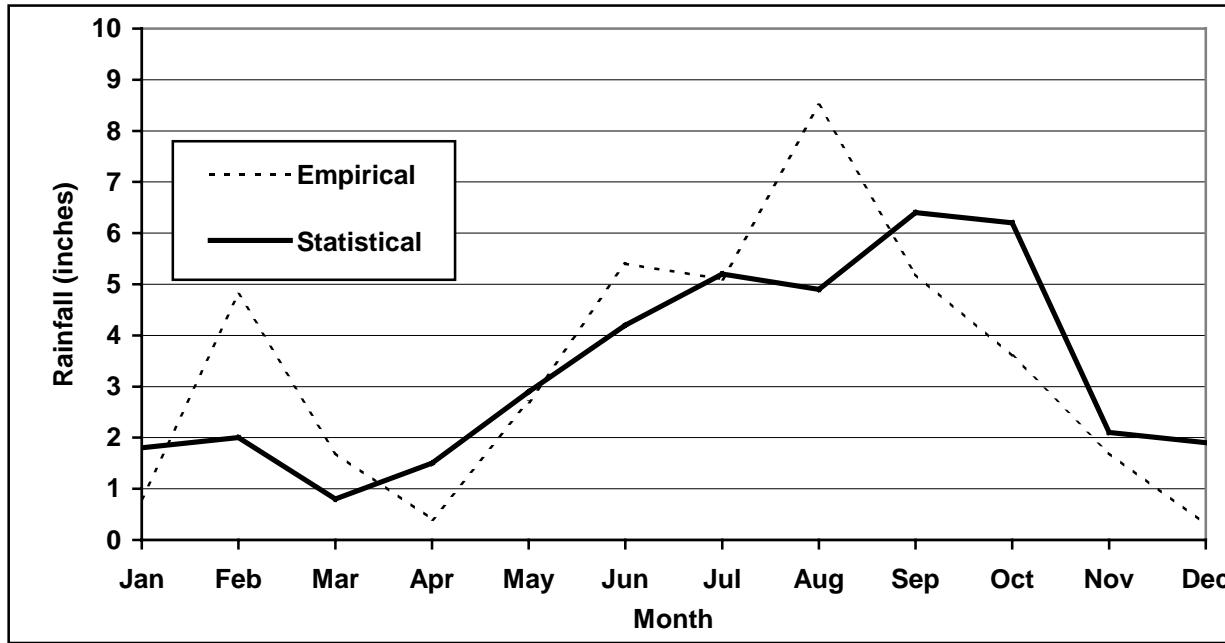


FIGURE C-3. Empirical vs. Statistical 1-in-10 year drought events for the Fort Pierce rainfall station.

TABLE C-9. Empirical vs. Statistical Citrus Supplemental Water Requirements.

	Rainfall Stations						
	Cow Creek	Vero Beach	Pratt	Fort Drum	S-308	Stuart	Fort Pierce
Annual (in)							
Empirical	32.83	30.62	29.29	29.48	30.40	30.62	30.40
Statistical	32.52	29.77	29.29	29.99	30.92	30.70	30.23
Max Month (in)							
Empirical	5.06 (July)	4.26 (May)	4.32 (May)	3.80 (April)	4.14 (July)	3.98 (June)	3.98 (April)
Statistical	3.81 (July)	3.66 (May)	3.74 (April)	3.71 (May)	3.53 (May)	3.65 (April)	3.62 (May)

Statistical Method

The statistical approach requires selection of the initial month and an analysis of twelve cumulative rainfall data sets. March was chosen as the month from which to begin the analysis because it marks the time of year when the rainfall-evapotranspiration deficit becomes the greatest. A statistical rainfall frequency analysis was performed on March rainfall for each station. Similar analyses were performed on historical rainfall for durations of two months (March through April) through twelve months (March through the following February). Estimates of 10 percent drought frequency rainfall were made for each duration and individual month amounts were obtained by subtraction of consecutive cumulative amounts (e.g., the November rainfall amount was obtained by subtracting the cumulative March-November drought frequency estimate from the cumulative March-October estimate). This analysis produces a set of monthly values that has a constant cumulative drought frequency of 10 percent. The individual month rainfall amounts (other than that of the initial month of March) do not have a prescribed drought frequency.

Each rainfall time series was fitted to the logarithmic-normal probability distribution. The log-

normal distribution is useful in defining many hydrologic random variables where the values of the variate are the result of underlying multiplicative factors, and are known to be strictly positive, (Alfredo *et al.*, 1975), and has been previously used to define rainfall. A non-parametric test was performed on each of the time series to assess the goodness of fit to the assumed underlying probability distribution.

The statistical 1-in-10 year drought event plots for the seven rainfall stations are shown in Figure C-4; while the values for 1-in-10 year drought events are listed in Table C-10.

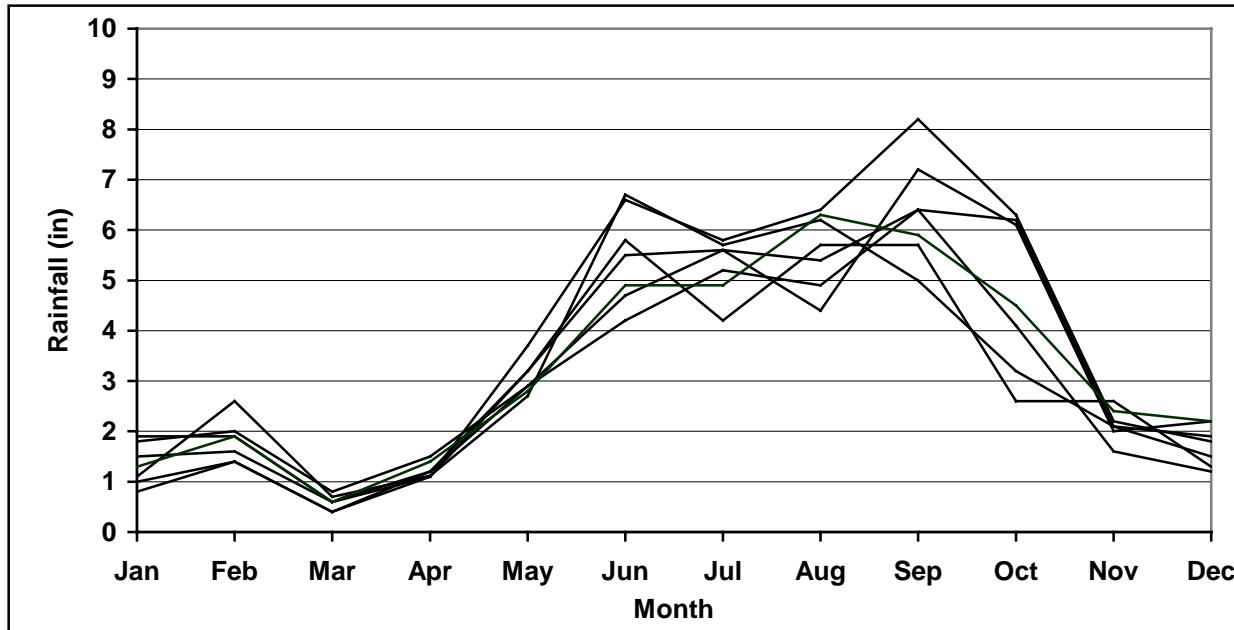


FIGURE C-4. Statistical 1-in-10 year drought events for seven rainfall stations.

TABLE C-10. Statistical 1-in-10 Rainfall (in inches) for Seven Rainfall Stations,
Calculations Starting with March.

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Sum
Cow Creek	0.8	1.4	0.4	1.1	3.2	5.8	4.2	5.7	5.7	2.6	2.6	1.3	34.8
Fort Drum	1.1	2.6	0.7	1.12	2.7	6.7	5.7	6.2	5.0	3.2	2.1	1.5	38.6
Fort Pierce	1.8	2.0	0.8	1.5	2.9	4.2	5.2	4.9	6.4	6.2	2.1	1.9	39.9
Pratt	1.5	1.6	0.6	1.1	3.7	6.6	5.8	6.4	8.2	6.3	2.2	1.8	45.8
S308	1.0	1.4	0.4	1.2	2.9	4.7	5.6	5.4	6.4	4.1	1.6	1.2	35.9
Stuart	1.9	1.9	0.6	1.2	3.2	5.5	5.6	4.4	7.2	6.1	2.0	2.2	41.8
Vero	1.3	1.9	0.6	1.4	2.8	4.9	4.9	6.3	5.9	4.5	2.4	2.2	39.1

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